Every Mother Initiative

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Postpartum Hemorrhage: Definition, Risk Factor Assessment, Prevention, Early Recognition and Response

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OCTOBER 13, 2015

UTAH DEPARTMENT OF HEALTH

Disclosures

- I have no conflicts of interest relevant to this presentation
- I receive research support from AirStrip for a study evaluating the feasibility of at-home NSTs

Disclosures

- I was on call last night and delivered 15 babies
- I slept zero
- I accidently brewed decaffeinated coffee this morning ☹

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Objectives

Discuss how PPH definition, risk factor assessment, prevention, early recognition and response can be *integrated into the healthcare system*.

Objectives

So…we have these tools. What do we do with them??

November 24

- Systems Level Readiness: Medical and surgical management including uterotonic medications and procedures (intrauterine balloon, uterine compression suture)

January 12

- Systems Level Readiness:
  OB Rapid Response Teams and Algorithms

UNIVERSAL OB MATHMATICAL CONSTANT

UNIVERSAL OB MATHMATICAL CONSTANT

240 =

UNIVERSAL OB MATHMATICAL CONSTANT*

240 =

FETAL HR + MD HR

*M. Varner, MD
Obstetrician/Mathematician

Choosing a PPH Definition

- Primary hemorrhage: Occurs within the first 24 hours of delivery
- In the U.S., it is classically defined by volume of blood loss
  - EBL >500 mL after vaginal birth
  - EBL >1000 mL after cesarean delivery
- Revised definition of >1000 mL after any delivery
  - “Active bleeding >1000 mL within the 24 hours following birth that continues despite the use of initial measures including first-line uterotonic agents and uterine massage.”

Evaluation and management of postpartum hemorrhage: consensus from an international expert panel. Transfusion. 2014 Jul;54(7):1756-68.

Choosing a Definition

- Revised definition of >1000 mL after any delivery
  - Consistent for all deliveries
  - Identifies women at high risk of adverse clinical outcomes
  - However, need protocol-driven earlier threshold to begin treatment

Evaluation and management of postpartum hemorrhage: consensus from an international expert panel. Transfusion. 2014 Jul;54(7):1756-68.

Choosing a Definition

- UUHSC has retained the ‘classic definition’
  - Ongoing quality improvement and safety initiative (comparing apples to apples)
  - Care algorithm is based on this definition
  - Concern regarding delayed treatment if we changed the definition

- From a hospital perspective, definition consistency is critical to implementing education and clinical protocols
- From a state perspective, definition consistency will be important for prospective assessment of trends and for comparisons

Choosing a Definition

- Can we reach consensus?
- Do we need to reach consensus?

Risk Factor Assessment

- Risk factors derived from the California Maternal Quality Care Collaborative http://www.cmqcc.org
  - Evidence-based
  - Expert consensus
  - Modifiable for each institution / hospital
    - We made minor modifications for UUHSC after multi-disciplinary committee review

Obstetric Hemorrhage Care Guidelines

All patients are active participants in their care. Patients should be informed of any risk factors they may have or develop for PPH and advised of recommendations for their care. These recommendations may be individualized to reflect the patient's decisions.

Prenatal Assessment Planning

Identify and prepare for patients with special considerations: placenta previa/accrete, bleeding disorders or those who decline blood products (and have risk factors)

Admission Hemorrhage Risk Factor Evaluation

Low Risk	Medium Risk – Red Dot Treat 2 or more risk factors as "high risk"	High Risk – Red Dot
• No previous uterine incision • Singleton pregnancy • <4 previous births • No known bleeding disorder • No history of PPH	• TOLAC • Multiple gestation • ≥ 4 previous births • History of previous PPH • Large uterine fibroids • Polyhydramnios • Estimated fetal weight > 4 kg • Morbid obesity (BMI > 35)	• Placenta previa • Suspected placenta accreta or percreta • Hematocrit < 30 AND other risk factors • Platelets < 20,000 • Known coagulopathy – draw/send appropriate lab tests as specifically ordered for this patient

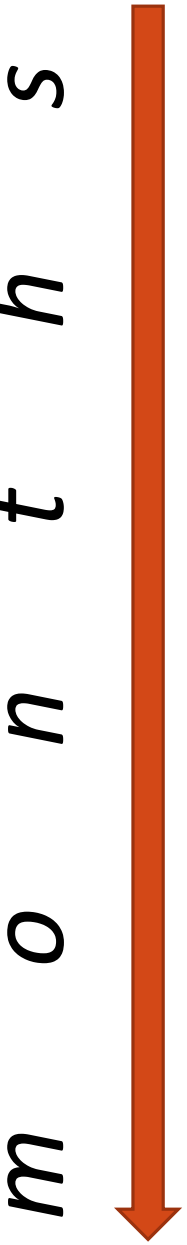
Admission Assessment & Planning		Ongoing Risk Assessment
Type and Screen all patients on admission	Evaluate for risk factors on admission • It is strongly recommended that all women who meet criteria for medium/high risk have IV access • If high risk, T&C for 2 units PRBC's & keep ahead 2; - keep these units available for 24 hours post delivery • Identify women who may decline transfusion and counsel and consent If the patient has moderate/high risk for PPH: • Review OB Hemorrhage Guideline	Evaluate for development of additional risk factors in labor: • Prolonged 2nd stage labor (4 hours, including time for "rest and descend") • Any oxytocin use • Sustained antepartum bleeding • Chorioamnionitis Risk Factors in this column are considered medium risk and need to be added to admission risk factors **Treat 2 or more risk factors as "high risk"**

Stage 0: All Births – Prevention & Recognition of OB Hemorrhage

- Active management of the third stage of labor
- Administer all IV Pitocin per postpartum Pitocin guideline or give 10 U Pitocin IM
- After initial EBL for delivery is determined all subsequent blood loss will be quantified (weighed) for 24 hrs and documented in I&O
- Ongoing evaluation of vital signs per guideline/orders
- Empty bladder; patients who have received an epidural/spinal are cathed (straight or Foley) prior to transfer to postpartum
- If patients fundus is not firm but EBL <500:
    1. Vigorous crede for at least 15 seconds
    2. Empty her bladder
    3. Consider Methergine (notify the OB Resident/Provider if this is given)

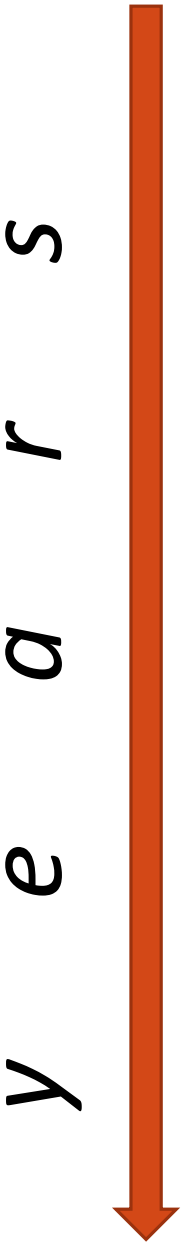
Comprehensive Education Prior to Implementation

- Multi-disciplinary committee review *and revision…and revision…and revision…and revision* → CONSENSUS
- Labor and delivery staff education
- Nursing education
- Physician education (from multiple practice groups)
- CNM education
- Resident education (ob/gyn and off-service)



Comprehensive Education Prior to Implementation

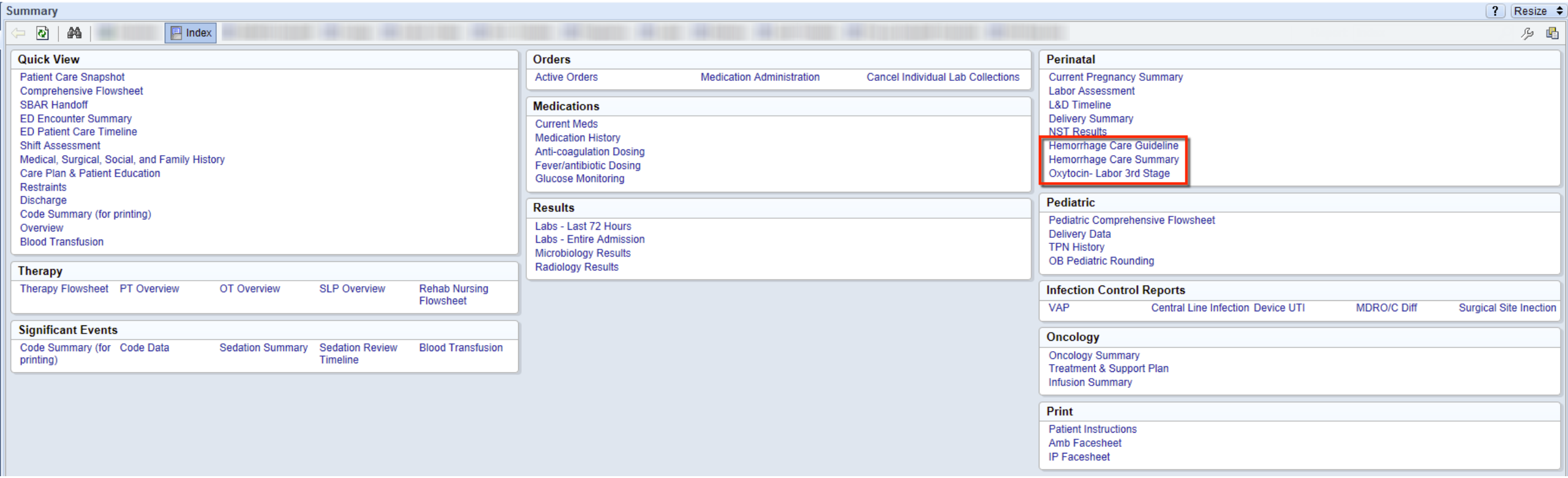
- Iterative process:
  - Educate…revise…educate…revise…educate…
  - Educate…educate…educate…educate…educate



Make Care Guideline Easily Accessible

- Distribute during educational sessions
  - Provide paper and electronic copies
- Post on the unit near work stations and ‘the board’
  - Post in bathrooms, break rooms
- Display in common areas (posters)
- Put documents into the EMR, if possible

Make Care Guideline Easily Accessible

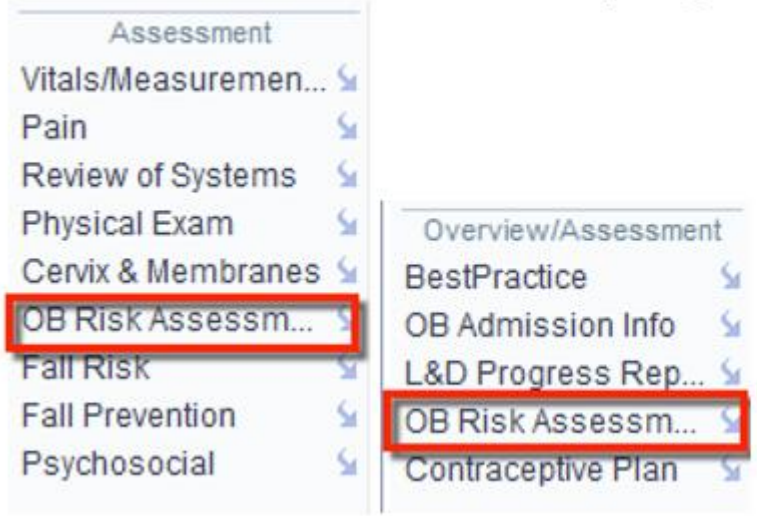


PPH Risk Assessments – Nursing (Triage, Admission, Shift Assessment Navigators)

Links to OB risk assessment are integrated into EMR navigators for nurses and providers.

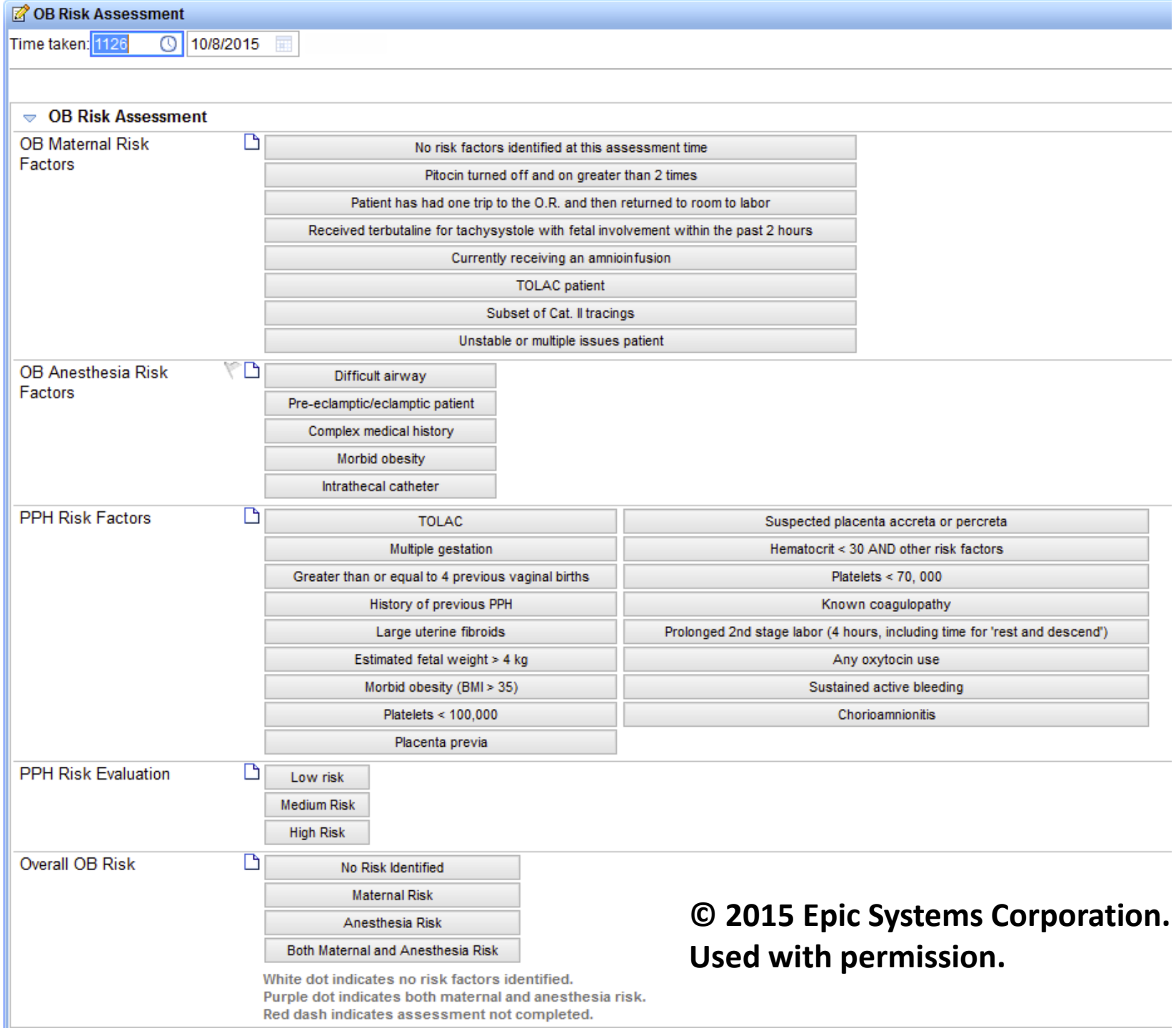
No EMR?
Find ways to integrate the assessment into work flow…
Forms, checklists.

PPH Risk Assessments – Providers (Triage, Admission, Rounding)



Initial Nursing Assessment

EMR Or Checklist



OB Antepartum Strip Review

Membrane Status: SROM
Rupture Date: 10/06/15
Rupture Time: 1330
Fluid Color: **(!) Meconium**

Dilation: 10
Effacement (%): 100
Station: +1

Baseline FHR: 120 per minute
Fetal heart variability: moderate
Fetal heart rate accelerations: present
Fetal heart rate decelerations: variable
Uterine contractions: regular, every 2 minutes

OB Risk Assessment

OB Maternal Risk Factors	OB Anesthesia Risk Factors	PPH Risk Factors	PPH Risk Evaluation	Overall OB Risk
		Greater than or equal to 4 previous vaginal births	**Medium Risk**	**Maternal Risk**

Room	Nurse	Risk	Name/MRN/...
2401			Promise, Ja...
2402	Janet F		App, Inductio...
2404	Christine S		Application, ...
2414	Janet F		Application, ...
LND			Storm, Leah ...
LND			Stork, Mom...
LND			Column, Mor...
LND			Column, Tes...
LND	Kimberly M		Test, Patty (...
ORA			Wilfork, Vinn...

DISPLAY RISK ASSESSMENT FOR EASY REFERENCE:

Grease board- electronic and 'old school'

Summary reports or chart flags

Pregnancy

Stork, Momma [20208032]

Birth Date:	08/03/85	Age (as of 10/08/15):	30
History:	G1P1		

Sticky note

OB Risk Assessment

OB Maternal Risk Factors	OB Anesthesia Risk Factors	PPH Risk Factors	PPH Risk Evaluation	Overall OB Risk
Pitocin turned off and on greater than 2 times; Patient has had one trip to the O.R. and then returned to room to labor; TOLAC patient	Difficult airway	History of previous PPH; Hematocrit < 30 AND other risk factors	High Risk	Both Maternal and Anesthesia Risk

Risk Factor Assessment

- What strategies have you used?
- What creative strategies can you brainstorm?

Prevention, Early Recognition and Response

- Algorithm derived from the California Maternal Quality Care Collaborative http://www.cmqcc.org
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- If patients fundus is not firm but EBL <500:
    1. Vigorous crede for at least 15 seconds
    2. Empty her bladder
    3. Consider Methergine (notify the OB Resident/Provider if this is given)

Stage 1: OB Hemorrhage: Meet one or more of the following criteria

1. Cumulative Blood Loss > 500 ml vaginal birth or > 1000 ml C/S **AND/OR** 2. Sustained Active Bleeding

MOBILIZE	ACT	THINK (differential diagnosis)
L &D - Initiate OB Rapid Response: Stage 1 PPH* **If in the OR – just page the CN to make her aware** Postpartum (MNBC or WSC units) – Initiate OB Rapid Response: Stage 1 PPH* ***Call 1-2222 or use Smartweb** Team to go immediately to the bedside to evaluate the patient If this is a CHC, UUHN, UFP, BCHC or private provider patient please notify	Primary nurse / L&D Rapid Response team • Tasks are designated on OB Rapid Response grid including: – Constant crede until uterine tone improves – IV resuscitation – Administer uteronics as ordered – Vital Signs q5 minutes – Empty bladder – Oxygen to maintain Sat≥95 – Keep patient warm Charge Nurse: • Initiate the Hemorrhage/Massive Hemorrhage Care set • Order T&C 2 Units PRBC's/keep ahead 2 if not already done Physician or Midwife: • Initiate treatment for atony-sequentially advance through appropriate uteronics • Rule out retained products of conception • Laceration • Hematoma Surgeon: • Inspect for uncontrolled bleeding at all levels, esp. broad ligament, posterior uterus and retained placenta	Consider potential etiology • Uterine atony • Trauma/laceration • Retained placenta • Amniotic fluid embolism • Coagulopathy • Placenta accreta • Uterine rupture

Patient should respond to these interventions within 10 minutes. If not, or if other procedures (uterine tamponade/banjo curette) are needed, move on to the Stage 2 response. If the patient is on Postpartum Unit, she needs to be transferred to L&D immediately.

UTEROTONIC AGENTS for POSTPARTUM HEMORRHAGE

Drug	*Administration Priority*	Dose	Route	Frequency	Contraindications	Possible Side Effects
Pitocin		30 units in 500 ml	IV	Per Guideline	Hypersensitivity to the drug	Usually none; potentially hypotension, nausea, vomiting, hyponatremia with prolonged IV administration
Methergine		0.2 mg	IM	Q 2-4 hours	Hypertension	Severe hypertension, nausea, vomiting
Hemabate		250 mcg	IM	Q 15 minutes for 8 doses/24 hours	Asthma/bronchospasm	Bronchospasm, diarrhea, nausea, vomiting, fever/chills
Cytotec		800 mcg	PR	One dose	Hypersensitivity to the drug	Diarrhea, nausea, vomiting, fever/chills

Stage 2: OB Hemorrhage

Meet Stage 1 criteria with continued sustained active bleeding not responding to interventions within 10 minutes with < 1500 mL cumulative blood loss

MOBILIZE

L & D
Send out the OB Rapid Response Stage 2 PPH (come now) page
This alerts the whole team to respond

Recommend that the patient is moved to the OR at this time.

If the patient is on a postpartum unit and has progressed to a Stage 2 PPH she is transferred immediately to L&D

- Notify L&D of transfer

If this is a CHC, UUHN, UFP, BCHC or private provider patient please notify

ACT

Primary nurse/L&D Rapid Response Team

- Call the Blood Bank and notify them of the need for emergency blood products as directed
- Tasks/responsibilities as designated on the OB Rapid Response grid

THINK (differential diagnosis)

Sequentially advance through procedures and other interventions based on etiology

Vaginal Birth:
Evaluate for uterine atony:

- Continue with uterotonics
- Uterine tamponade balloon
- Consider surgical interventions

Evaluate for lacerations

- Visualize and repair

Evaluate for retained products of conception:

- Manual removal
- D&C

Evaluate for uterine inversion:

- General anesthesia or Nitroglycerine for uterine relaxation for manual reduction

Cesarean Section:

- Continue with uteronics
- B-Lynch
- O'Leary
- Uterine tamponade balloon

If Amniotic Fluid Embolism (AFE):
Maximally aggressive respiratory, vasopressor and blood product support

Once Stabilized: modified postpartum management with increased surveillance

If cumulative blood loss > 1500 mL, >2 units of PRBC's given, hemodynamically unstable or suspicion for DIC: Proceed to Stage 3

Stage 3: OB Hemorrhage

Cumulative blood loss > 1500 mL, need for rapid administration of blood products, hemodynamically unstable or suspicion of DIC

MOBILIZE	ACT	THINK (differential diagnosis)
Patient must be moved to the OR at this time if she is not already there If this is a CHC, UUHN, UFP, BCHC or private provider patient please notify	Primary nurse/L&D Rapid Response Team: • Tasks/responsibilities as designated on OB Rapid Response grid Primary nurse or designee: • Obtain/send ABG's and labs as ordered	• Prevention of hypothermia, acidemia • Conservative or definitive surgery: ➢ B-Lynch ➢ O'Leary ➢ Hysterectomy • Transfuse blood products as needed • Unresponsive coagulopathy • **Consider off-label use of factor rVIIa for severe PPH refractory to treatment**

Once stabilized:

- **Consider ICU transfer (notify the House Supervisor)**
- **Vigilant postpartum management with increased surveillance**

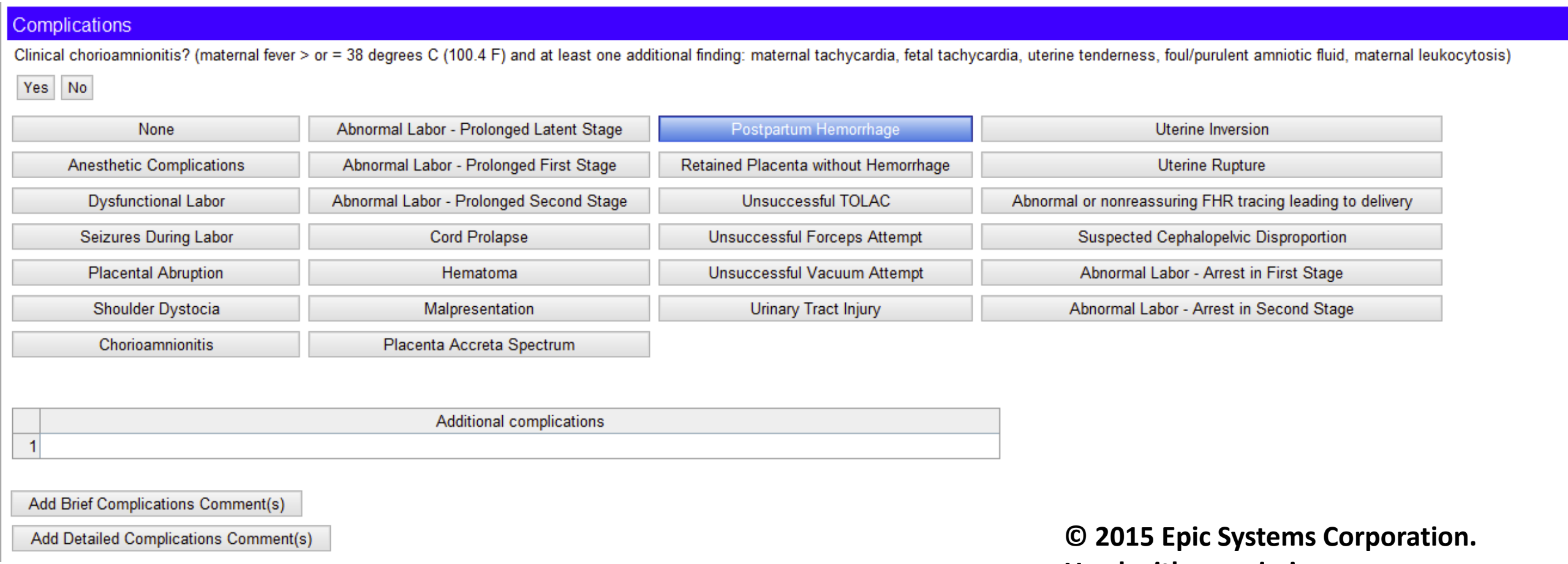
Blood Products

Packed Red Blood Cells (PRBC): • Type & Screen :approximately 60-90 minutes to complete • Type & Cross: approximately 30 minutes to covert T&S to cross matched blood • If you cannot wait the 30 minutes for cross matched blood you may receive: ➢ O negative ➢ Type specific blood but not crossmatched	1 unit typically increases to Hct by 3 %
Fresh Frozen Plasma (FFP): Approximately 30 minutes to thaw	1 unit typically 180 ml and typically increased Fibrinogen by 10mg/dL
Platelets: Approximately 15 minutes to thaw	Provides a transient 40-50 K increase in platelet count
Cryoprecipitate (Cryo): Approximately 30 minutes to thaw	10 pack typically raises Fibrinogen 80-100 mg/dL
Factor rVIIa	1. Dose is 90 mcg/kg, infused over 3-5mins 2. Second dose 90 mcg/kg can be considered if there is no response in 20- 30mins. **Do not use rFVIIa to compensate for an inadequate transfusion therapy - aim for PLTs> 50, INR<1.5 and fibrinogen >1g/l and correct acidosis, hypocalcemia and hypothermia before using rFVIIa.**

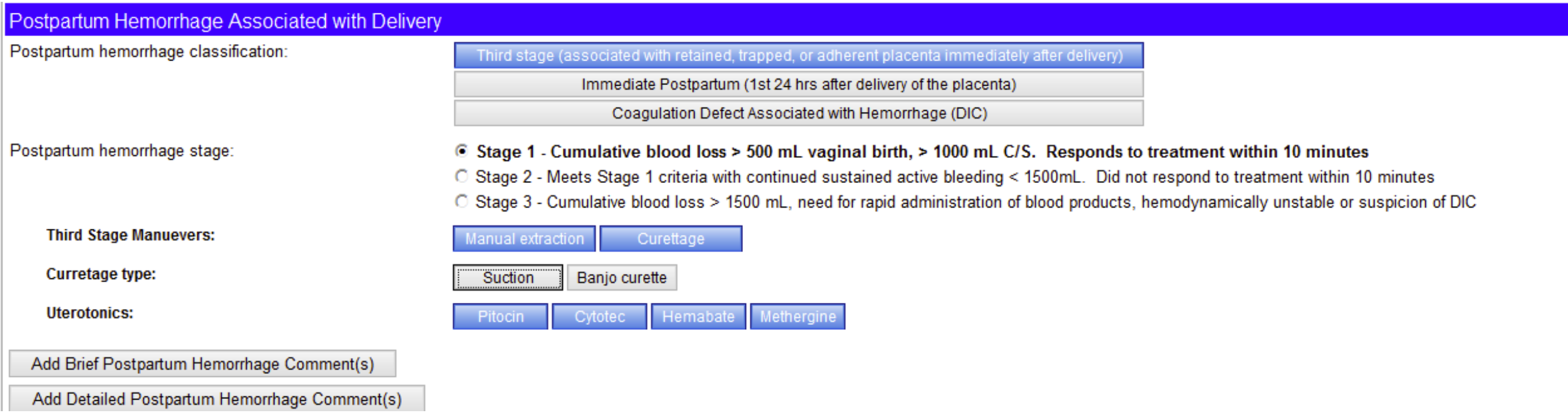
Prevention, Early Recognition and Response

- Do you have an algorithm?
- What does it look like? (Where do you find it?)
- What should it look like?

Documentation of PPH



PPH Associated with Delivery



PPH Associated with Delivery

Postpartum Hemorrhage Associated with Delivery

Postpartum hemorrhage classification:

- Third stage (associated with retained, trapped, or adherent placenta immediately after delivery)
- **Immediate Postpartum (1st 24 hrs after delivery of the placenta)**
- Coagulation Defect Associated with Hemorrhage (DIC)

Postpartum hemorrhage stage:

- (•) **Stage 1 - Cumulative blood loss > 500 mL vaginal birth, > 1000 mL C/S. Responds to treatment within 10 minutes**
- ( ) Stage 2 - Meets Stage 1 criteria with continued sustained active bleeding < 1500mL. Did not respond to treatment within 10 minutes
- ( ) Stage 3 - Cumulative blood loss > 1500 mL, need for rapid administration of blood products, hemodynamically unstable or suspicion of DIC

Immediate PPH - Etiology:

- **Atony**
- **Genital Tract Laceration**
- **Retained Products of Conception**

Atony manuevers: Uterine massage | B-Lynch Suture | O'Leary Suture | Intrauterine Balloon | **Other (Add comment)**

Other atony manuevers:

Uterotonics: Pitocin | Cytotec | Hemabate | Methergine

Genital tract laceration comment: See laceration section for repair details

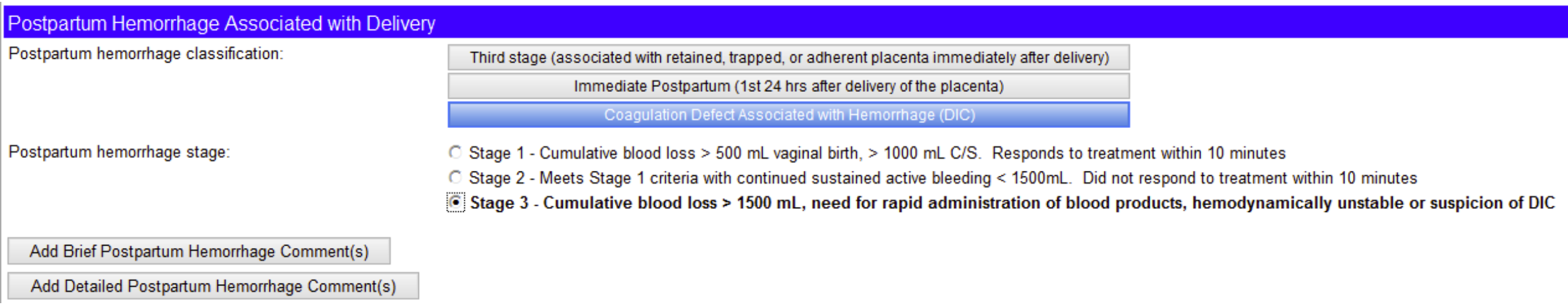
Retained products procedures: Manual extraction | D&C

Uterotonics: Pitocin | Cytotec | Hemabate | Methergine

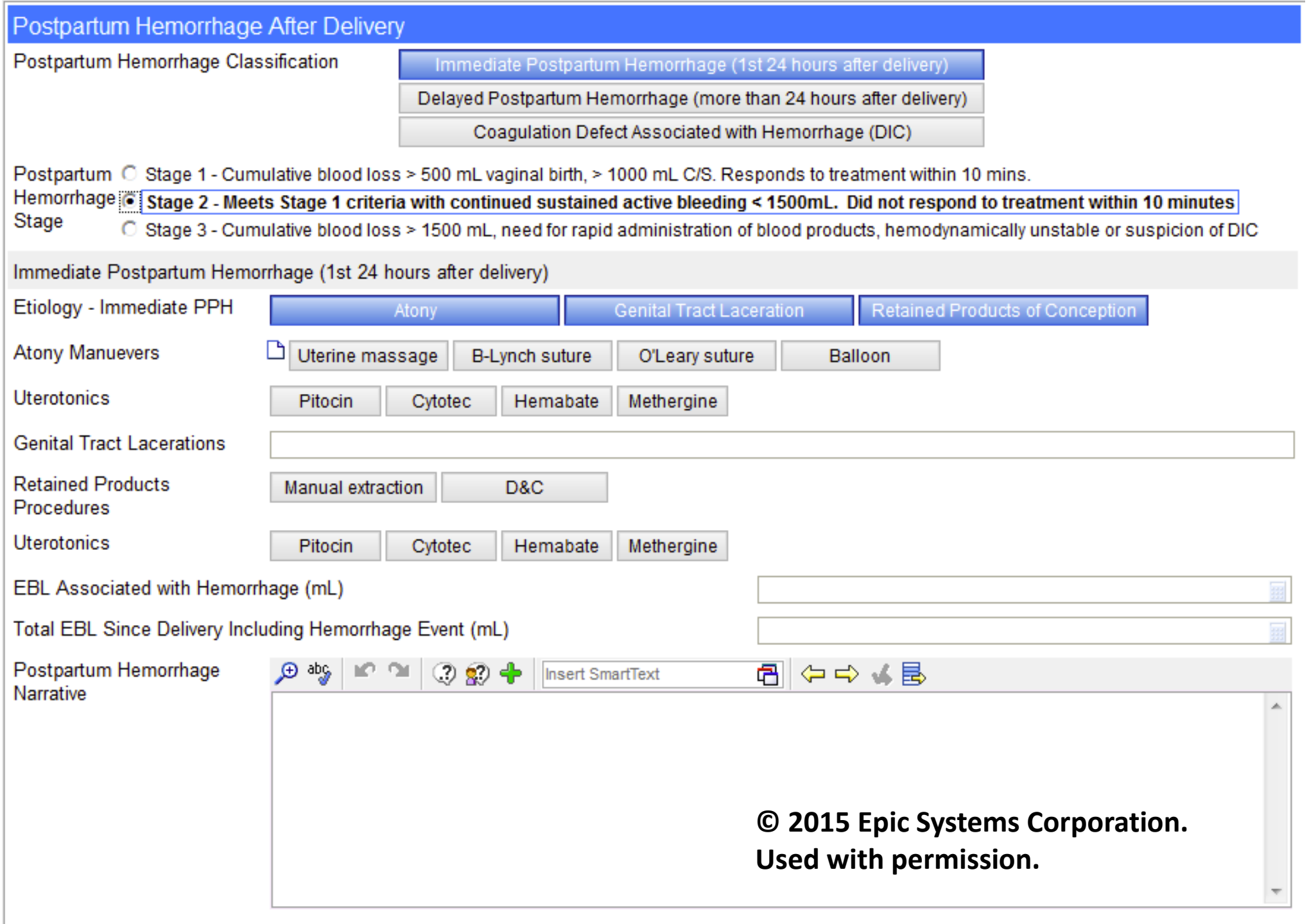
Add Brief Postpartum Hemorrhage Comment(s)

Add Detailed Postpartum Hemorrhage Comment(s)

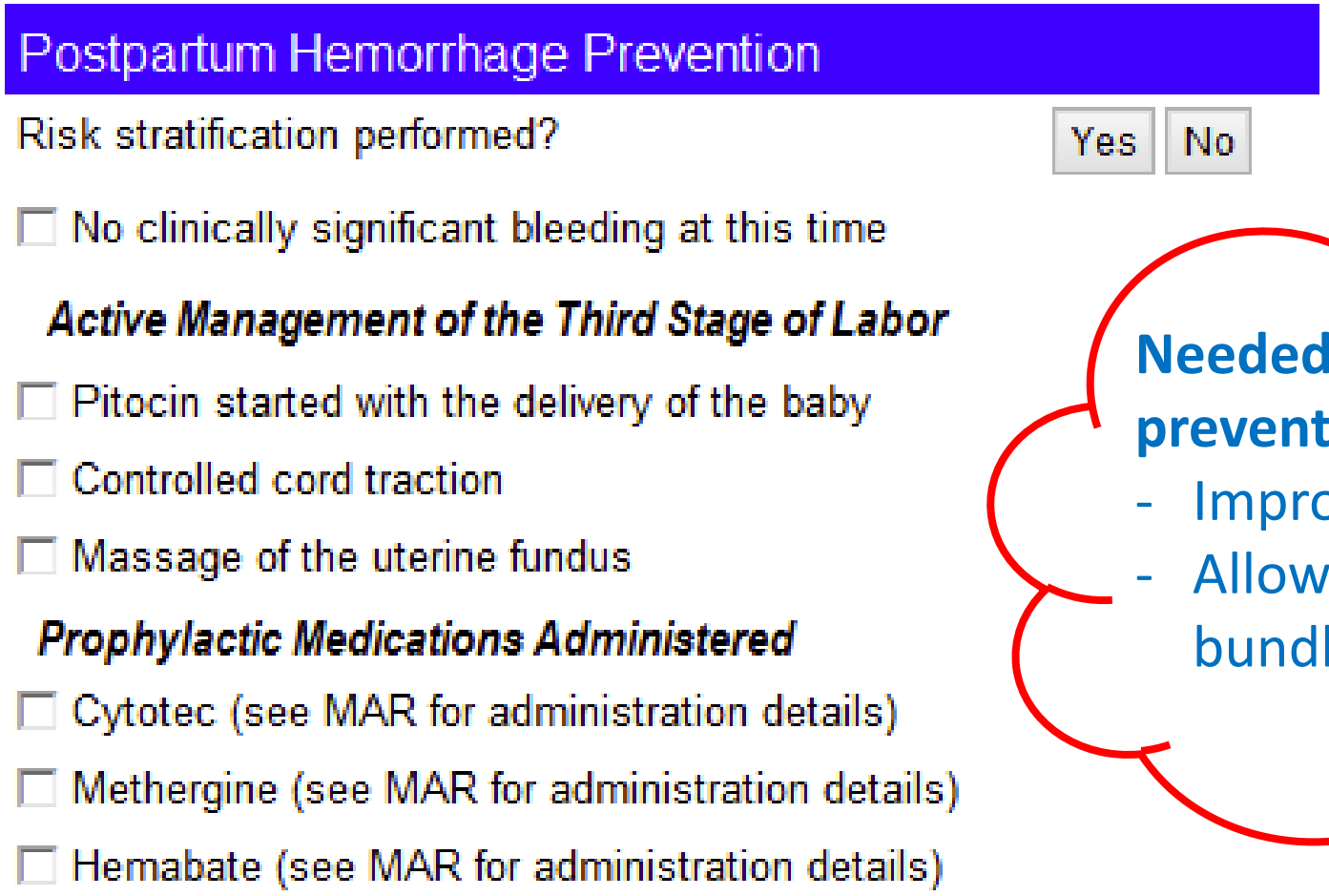
PPH Associated with Delivery



Note: PPH After Delivery



Documentation of PPH Prevention: MD



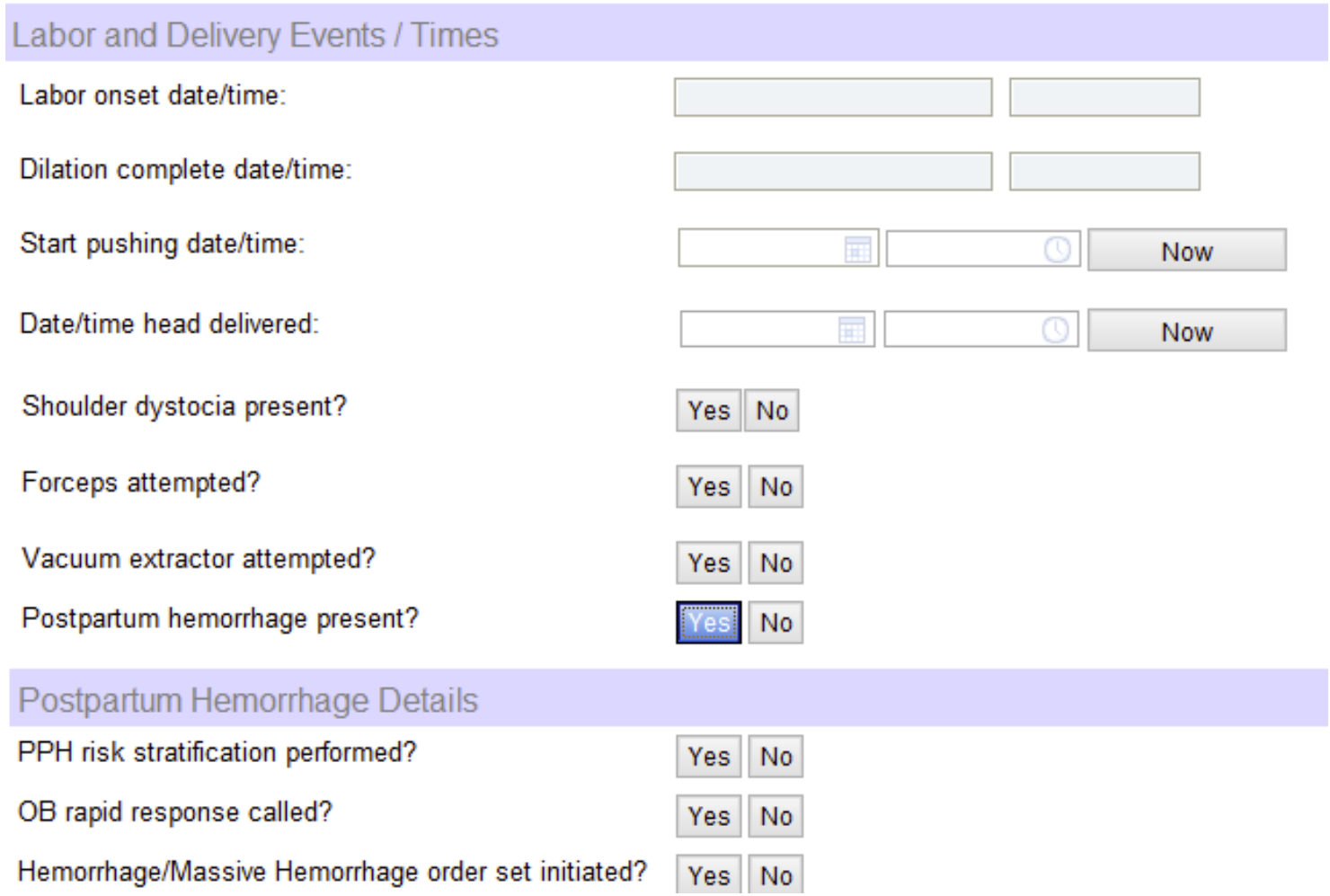
Needed clear delineation of PPH prevention versus treatment:

- Improved coding and capture
- Allowed tracking of PPH bundle components

Documentation of PPH: RN

Our electronic note has clear sections for nurses and physicians to document
WHAT THEY DO.

This works for PPH documentation, too.



Recorded Blood Loss After Vaginal Delivery

Blood Loss Associated with Delivery

Vaginal delivery est. blood loss (mL): 200

*Blood Loss Report

Mother's Information

Start of Mother's Information

IO Blood Loss

Mom's I/O Activity

Measured Blood Loss	Hospital Encounter	357 mL
Estimated Blood Loss	Hospital Encounter	200 mL
Total		557

Recorded Blood Loss After Cesarean

Blood Loss Associated with Delivery

Vaginal delivery est. blood loss (mL):

*Blood Loss Report

Mother's Information

Start of Mother's Information

IO Blood Loss

Mom's I/O Activity

Measured Blood Loss	Hospital Encounter	55 mL
Estimated Blood Loss	Hospital Encounter	30 mL
Estimated Blood Loss	Anesthesia	673 mL
Total		758

Documentation of PPH

- How is your institution documenting PPH?
  - On L&D? On postpartum?
- Do you use forms or checklists?

Discussion